

WHAT IS CLAIMED IS:

1. A viscoelastic foam made from a Part A composition and a Part B composition, said Part A composition comprising 20-50 weight percent isocyanate (NCO), said Part B composition comprising at least 10 parts by weight of one or a mixture of propylene oxide-extended amine-based polyether polyols having substantially no ethylene oxide extension units, at least 10 parts by weight of an additional polyol selected from the group consisting of filled polyether polyols and unfilled polyether polyols, and 0.01-4 parts by weight catalyst, said Part A and Part B compositions being combined to provide said viscoelastic foam having an index of 60-130.
2. A viscoelastic foam made from a Part A composition and a Part B composition, said Part A composition comprising 20-50 weight percent isocyanate (NCO), said Part B composition comprising at least 10 parts by weight of one or a mixture of propylene oxide-extended amine-based polyether polyols having substantially no ethylene oxide extension units, at least 10 parts by weight of an additional, tri-functional polyether polyol, and 0.01-4 parts by weight catalyst, said Part A and Part B compositions being combined to provide said viscoelastic foam having an index of 60-130.
3. A viscoelastic foam according to claim 1 or 2, having an index of 60-115.
4. A viscoelastic foam according to claim 1 or 2, having an index of about 65-115.
5. A viscoelastic foam according to claim 1 or 2, said Part B composition further comprising about 1-3 parts by weight water.
6. A viscoelastic foam according to claim 1 or 2, said Part B composition further comprising about 1-6 parts by weight black paste.
7. A viscoelastic foam according to claim 1 or 2, said isocyanate in said Part A composition being present in the form of 4,4'-MDI.

8. A viscoelastic foam according to claim 7, said 4,4'-MDI being present in said Part A composition in an amount sufficient to provide an isocyanate (NCO) concentration of about 33.6 percent by weight.

9. A viscoelastic foam according to claim 1 or 2, said isocyanate in said Part A composition being present in the form of an allophanate-modified MDI prepolymer, said part A composition having an isocyanate (NCO) concentration of about 20-30 percent by weight.

10. A viscoelastic foam according to claim 1 or 2, said one or a mixture of propylene oxide-extended amine-based polyether polyols comprising monoethanolamine-based polyol in an amount of 0-10 parts by weight, triethanolamine-based polyol in an amount of 10-70 parts by weight, and ethylenediamine based polyol in an amount of 0-36 parts by weight.

11. A viscoelastic foam according to claim 1 or 2, said catalyst comprising amine catalyst in an amount of 0-2.5 parts by weight, delayed action catalyst in an amount of 0-1 parts by weight, and trimerization catalyst in an amount of 0-1 parts by weight [already stated in claim 1].

12. A viscoelastic foam according to claim 11, said amine catalyst being tertiary amine catalyst, said delayed action catalyst being a combination delayed action catalyst, said trimerization catalyst being a quaternary ammonium salt trimer catalyst.

13. A viscoelastic foam according to claim 1 or 2, said additional polyol being a glycerin-based polyoxypropylene-polyoxyethylene-extended polyether polyol.

14. A viscoelastic foam according to claim 1 or 2, said additional polyol being a polyoxypropylene-polyoxyethylene-extended polyether polyol.

15. A viscoelastic foam according to claim 1 or 2, said additional polyol being a non-amine-based polyether polyol.

16. A method of making a viscoelastic foam comprising the steps of:

a) providing a Part A composition comprising 20-50 weight percent isocyanate;

- b) providing a Part B composition comprising at least 10 parts by weight of one or a mixture of propylene oxide-extended amine-based polyether polyols having substantially no ethylene oxide extension units, at least 10 parts by weight of an additional polyol selected from the group consisting of filled polyether polyols and unfilled polyether polyols, and 0.01-4 parts by weight catalyst; and
- c) combining said Part A and Part B compositions to provide said viscoelastic foam, said viscoelastic foam having an index of 60-130.

17. A method of making a viscoelastic foam comprising the steps of:

- a) providing a Part A composition comprising 20-50 weight percent isocyanate;
- b) providing a Part B composition comprising at least 10 parts by weight of one or a mixture of amine-based polyether polyols having substantially no ethylene oxide extension units, at least 10 parts by weight of an additional, tri-functional polyether polyol, and 0.01-4 parts by weight catalyst; and
- c) combining said Part A and Part B compositions to provide said viscoelastic foam, said viscoelastic foam having an index of 60-130.

18. A method according to claim 16 or 17, said viscoelastic foam having an index of 60-115.

19. A method according to claim 16 or 17, said Part B composition further comprising about 1-3 parts by weight water.

20. A method according to claim 16 or 17, said Part B composition further comprising about 1-6 parts by weight black paste.

21. A method according to claim 16 or 17, said isocyanate in said Part A composition being present in the form of 4,4'-MDI.

22. A method according to claim 21, said 4,4'-MDI being present in said Part A composition an amount sufficient to provide an isocyanate (NCO) concentration of about 33.6 percent by weight in said Part A composition.

23. A method according to claim 16 or 17, said isocyanate in said Part A composition being present in the form of an allophanate-modified MDI prepolymer.

24. A method according to claim 16 or 17, said one or a mixture of propylene oxide-extended amine-based polyether polyols comprising monoethanolamine based polyol in an amount of 0-10 parts by weight, triethanolamine based polyol in an amount of 10-70 parts by weight; and ethylenediamine based polyol in an amount of 0-36 parts by weight.

25. A method according to claim 16 or 17, said catalyst comprising amine catalyst in an amount of 0-2.5 parts by weight, a delayed action catalyst in an amount of 0-1 parts by weight, and a trimerization catalyst in an amount of 0-1 parts by weight.

26. A method according to claim 25, said amine catalysts being tertiary amine catalysts, said delayed action catalyst being a combination delayed action amine/delayed action tin catalyst, and said trimerization catalyst being a quaternary ammonium salt trimer catalyst.

27. A viscoelastic foam according to claim 16 or 17, said additional polyol being a polyoxypropylene-polyoxyethylene-extended polyether polyol.

28. A viscoelastic foam according to claim 1 or 2, said Part B composition further comprising 1-15 parts by weight black paste.

29. A foam, said foam being a semi-rigid viscoelastic foam that is substantially 100% recoverable following an impact at 4 m/s with an unyielding object, said foam exhibiting negligible loss of strength after recovery thereof.

30. A foam according to claim 29, said foam being substantially 100% recoverable following an impact at 7 m/s with an unyielding object, said foam exhibiting negligible loss of strength after recovery thereof.

31. A foam according to claim 29, wherein on impact with a flat circular impactor having a 4-inch diameter, a sample of said foam measuring 5.5" x 5.5" x 1" thick exhibits about 100 g's of breakthrough acceleration at an impact speed of about 2 meters per second,

and about 150 g's of breakthrough acceleration at an impact speed of about 6 meters per second.

32. A foam according to claim 29, wherein on impact with a flat circular impactor having a 4-inch diameter, a sample of said foam measuring 5.5" x 5.5" x 1" thick exhibits about 14 percent compression at an impact speed of about 2 meters per second, and about 60 percent compression at an impact speed of about 6 meters per second.

33. A foam according to claim 31, wherein on impact with a spherical impactor having a 4-inch diameter, a sample of said foam measuring 5.5" x 5.5" x 1" thick exhibits about 50 g's of breakthrough acceleration at an impact speed of about 2 meters per second, and about 80 g's of breakthrough acceleration at an impact speed of about 4 meters per second.

34. A foam according to claim 32, wherein on impact with a spherical impactor having a 4-inch diameter, a sample of said foam measuring 5.5" x 5.5" x 1" thick exhibits about 25 percent compression at an impact speed of about 2 meters per second, and about 45 percent at an impact speed of about 4 meters per second.